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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/530,777

10/17/2005

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02/18/2009

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EXAMINER

HAWKINS, KARLA

ART UNIT

PAPER NUMBER

1797

MAIL DATE

DELIVERY MODE

02/18/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/530,777	Applicant(s) KARICHEV ET AL.	
	Examiner KARLA HAWKINS	Art Unit 1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 November 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 April 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This is the 2nd non-final office action for application 10/530,777.
2. Claims 9-20 are new, claims 1-20 are pending.
3. Claim 13 at line 2 recites "switch means for selectively allowing air flowing from the blower [.]". The Applicant's specification supports in figure 1 the means comprising pipelines and a stop valve, the stop valve is made in the form of switches (see Applicants' specification, page 3, line 4-9). Accordingly, this means-plus-function language invokes a 35 U.S.C. 112, sixth paragraph limitation (see MPEP § 2181).

Claim Objections

4. The numbering of claims is not in accordance with 37 CFR 1.126 which requires the original numbering of the claims to be preserved throughout the prosecution. When claims are canceled, the remaining claims must not be renumbered. When new claims are presented, they must be numbered consecutively beginning with the number next following the highest numbered claims previously presented (whether entered or not). There are to new claim 11's, the misnumbered second claim 11 been renumbered to claim 12.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which

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said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:
 1. Determining the scope and contents of the prior art.
 2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
7. Claim(s) 1-20 are rejected under 35 USC 103 (a) as being obvious over **GOLDSTEIN ET AL. (US 5,595,949)** in view of **CASSIDY (US 2002/0005117)**.
8. Regarding claims 1, 3, 9, and 12 **GOLDSTEIN** discloses a method of CO₂ absorbent material for removing carbon dioxide from an air inflow to a metal-air battery or fuel cell (abstract); and for regeneration requiring a high-temperature roast step (col. 4, lines 35-44).
9. **GOLDSTEIN** does not appear to explicitly disclose heating air spent in the fuel cell to a temperature of 60-120° C, and first and second adsorbers.
10. However, **CASSIDY** discloses heated air (at, for example, 180-190°C) is used in the purge cycle (paragraph 34); and first and second adsorbers 16a and 16b (paragraph 24); means for supplying heated air (claim 16);

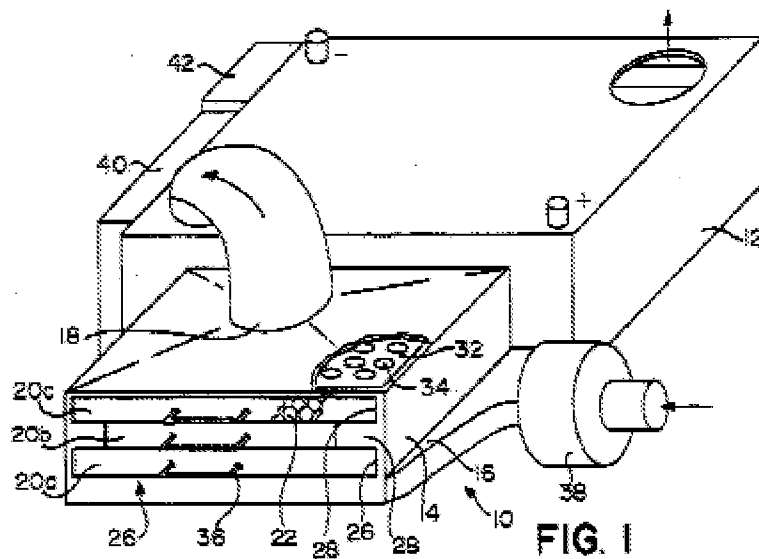
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* **GOLDSTEIN** and **CASSIDY** are analogous art because they are from the same field of endeavor of air purification.

11. At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify the method of **GOLDSTEIN** to include the heating of the air spent of in the fuel cell to 180-190°C and adsorbers of **CASSIDY**.
12. The motivation would have been to improve the general system of removing a wide variety of chemicals agents (**CASSIDY**, paragraph 5).
13. Therefore, the invention as a whole would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made.
14. With further regard to claims 1 and 9, the combination of **GOLDSTEIN** **CASSIDY** discloses the claimed invention except for the heated air spent in the fuel cell temperature of 60-120° C. It would have been obvious to one having ordinary skill in the art at the time the invention was made to be in the range of 60-120° C, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.
15. With further regard to claim 3 and 12, **GOLDSTEIN** teaches a blower 38 (figure 1); containers 20a, 20b, and 20c each container holding a CO₂ adsorbent material (col. 5, lines 61-67; figure 1); Figure 4 depicts a further embodiment of the system, an air blower 38, having an outlet port 60, is

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connected to one port 62 of a four-way valve 64(col. 7, lines 3-5). Figure 4 displays connection means. **GOLDSTEIN** does not specifically teach the pipelines, but **GOLDSTEIN** does teach connection means connecting the blower, adsorbers, fuel cell and heated air. If the prior art structure is capable of performing the intended use, then it meets the claim, Apparatus claims must be structurally distinguishable from the prior art in terms of structure, not function. The manner of operating an apparatus teaches all of the structural limitations of the claim (see MPEP § 2114 and § 2173.05 (g)).



16. Regarding claims 3, 11, and 13 **GOLDSTEIN** discloses a four-way valve 64(col. 7, lines 3-5). **CASSIDY** discloses pressure swing adsorbers are cycled to regenerate them so that, at any one time, one pressure swing

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adsorber is operative while the other pressure swing adsorber is being regenerated (paragraph 24).

17. Regarding claims 2 and 10, **GOLDSTEIN** discloses air humidification unit 42 (figure 1). **GOLDSTEIN** discloses the claimed invention except for the relative humidity range of 15 to 85%. It would have been obvious to one having ordinary skill in the art at the time the invention was made to be within 15 to 85%, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

18. Regarding claims 14, **CASSIDY** discloses heated air (at, for example, 180-190°C) is used in the purge cycle (paragraph 34). **GOLDSTEIN** teaches an air blower 38, having an outlet port 60, is connected to one port 62 of a four-way valve 64 (col. 7, lines 3-5).

19. Regarding claims 4 and 15, **GOLDSTEIN** teaches housing 14 (figure 1). **GOLDSTEIN** discloses the claimed invention except for the adsorbers being rotatable. It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the adsorbers rotatable, since it has been held that the provision of adjustability, where needed, involves routine skill in the art. *In re Stevens*, 101 USPQ 284 (CCPA 1954).

20. Regarding claims 6, 8, 20-21, **GOLDSTEIN** discloses a thermal management controller 42 (figure 1).

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21. Claim(s) 5, 7, 16-19 are rejected under 35 USC 103 (a) as being obvious over the combination of **GOLDSTEIN ET AL. (US 5,595,949)** and **CASSIDY (US 2002/0005117)** in further view of **OOHARA (US 6,238,544 B1)**.
22. The combination of **GOLDSTEIN CASSIDY** discloses a method of CO₂ absorbent material for removing carbon dioxide from an air inflow to a fuel cell (abstract);
23. **GOLDSTEIN** does not appear to explicitly disclose the adsorbents comprising a hydrate oxide of zirconium,
24. However, **OOHARA** discloses ions effectively adsorbed by zirconium hydroxide (col. 2, lines 32-36)
- * **GOLDSTEIN** and **CASSIDY** are analogous art because they are from the same field of endeavor of purification methods.
25. At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify the adsorbent of **GOLDSTEIN** to include the zirconium hydroxide of **OOHARA**.
26. The motivation would have been to make the purification process higher efficiency, and also more stable, economical and industrially highly practical (col.2, lines 26-31).
27. Therefore, the invention as a whole would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made.

Response to Arguments

28. Applicant's arguments with respect to claim 1-8 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KARLA HAWKINS whose telephone number is (571) 270-5562. The examiner can normally be reached on Monday-Thursday 7:30- 5, alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duane Smith can be reached on 571-272-1166. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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/DUANE SMITH/
Supervisory Patent Examiner, Art Unit 1797

/Karla Hawkins/
Examiner
Art Unit 1797
